



# SPACE LAUNCH SYSTEM

DECEMBER 2018-JANUARY 2019

## BIG TANK, BIG TEST



# LARGEST SLS HARDWARE INSTALLED FOR TESTING



The largest piece of structural test hardware for the SLS, the liquid hydrogen (LH2) tank test article, was loaded into Test Stand 4693 at NASA's Marshall Space Flight Center Jan. 14 after transport from the Michoud Assembly Facility on NASA's barge Pegasus. The LH2 tank is part of the rocket's core stage, storing cryogenic liquid hydrogen and liquid oxygen that will feed the vehicle's RS-25 engines. The test article is structurally identical to the flight version of the tank and will be pushed and pulled by dozens of hydraulic cylinders in the test stand, subjecting it to the same stresses and loads it will endure during liftoff and flight.

Read more: [go.nasa.gov/2QQLlfp](https://go.nasa.gov/2QQLlfp)





# EM-1 CORE STAGE COMES TOGETHER

The SLS Core Stage liquid oxygen tank, intertank and forward skirt flight articles for Exploration Mission-1 (EM-1) completed production in 2018 allowing NASA technicians to join the components at the Michoud Assembly Facility. The vertical stacking of the top parts of the core stage, called the “forward join,” is a major step in getting the rocket ready for EM-1, the first flight of SLS and the Orion spacecraft.

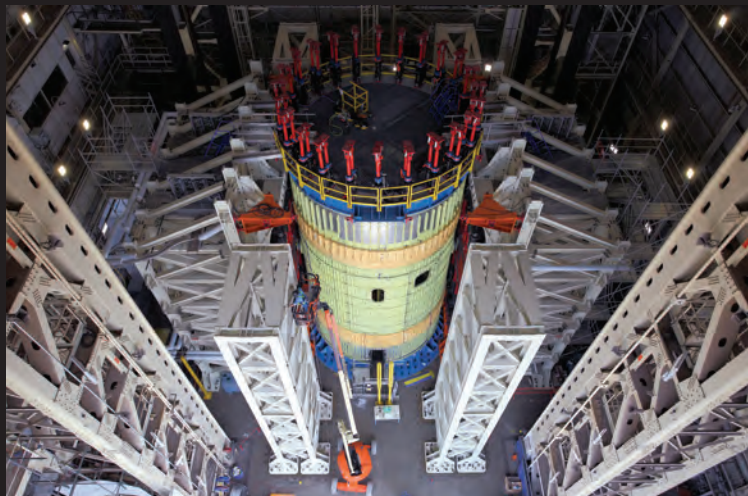
Learn more about the SLS core stage: [go.nasa.gov/2TmoNie](https://go.nasa.gov/2TmoNie)



# SLS PROGRESS REPORT

In addition to the delivery of the LH2 test article to Marshall Space Flight Center, the SLS team saw many milestones in 2018 as various components of NASA's new deep space rocket completed production and testing. Here are some of the highlights of the rocket's progress.

## INTERTANK STRUCTURAL TESTING UNDERWAY



The intertank structural test article arrived at Marshall Space Flight Center and completed the first round of tests to ensure it is up to the stresses of launch and flight. The intertank feels the strongest forces of any part of the core stage from SLS's two solid rocket boosters and four engines that produce a combined thrust of more than 8 million pounds. Tests were also conducted on the intertank's avionics.

Learn more: [go.nasa.gov/2QSP76r](https://go.nasa.gov/2QSP76r)

## ENGINE INNOVATION PUSHES LIMITS



With the four RS-25 engines that will power SLS's first mission complete, teams at Aerojet Rocketdyne have been building new, innovative parts to power the rocket on future flights. These components, some of which are built with 3D printers, were hot fired in a new series of tests.

Read the full story: [go.nasa.gov/2SnFdWz](https://go.nasa.gov/2SnFdWz)

## ORION STAGE ADAPTER DELIVERED TO KENNEDY SPACE CENTER



The Orion Stage Adapter (OSA) was delivered to Kennedy Space Center. The OSA will connect the Orion spacecraft to the interim cryogenic propulsion stage on the upper part of the SLS rocket. During EM-1, the adapter will carry 13 CubeSats as secondary payloads.

Read the full story: [go.nasa.gov/2EUwbOp](https://go.nasa.gov/2EUwbOp)

## OPERATIONS SUPPORT “BIG VOICE” TEST SUCCESSFUL



The SLS Engineering Support Center at Marshall Space Flight Center successfully tested voice communications for EM-1. The test connected engineers and technical experts at 13 locations around the United States, ensuring that the team can work together efficiently to keep astronauts safe during flight.

Read the full story: [go.nasa.gov/2LBYeCH](https://go.nasa.gov/2LBYeCH)



# WHAT'S NEW IN SLS SOCIAL MEDIA



## ROCKET SCIENCE IN 60 SECONDS

Four RS-25 engines provide more than 2 million pounds of thrust during liftoff of the SLS rocket. Jonathan Pahed, component product engineer, explains what makes these engines roar.

Watch the latest Rocket Science video here:  
[bit.ly/2UfjLUS](https://bit.ly/2UfjLUS)

## SLS ON THE ROAD



About 50 employees of INFINITY Science Center, the welcome center for NASA's Stennis Space Center, got an overview and update on SLS progress Dec. 12. The employees included docents, guides, educational personnel and center executives.



# BOOSTER SEGMENTS READY

The final solid rocket booster segment for the first flight of the SLS rocket and Orion spacecraft was moved to storage at Northrop Grumman's Utah facility Jan. 10. The 10 EM-1 motor segments await shipment to Kennedy Space Center where they will be stacked to form the two boosters, which will generate 3.6 millions of pounds of thrust each during liftoff of the first integrated mission of SLS and Orion.

Learn more about the SLS solid rocket boosters: [go.nasa.gov/2LPikcC](https://go.nasa.gov/2LPikcC)



## SPACEFLIGHT PARTNERS: *Moog Inc., Space and Defense Group*

**NUMBER OF EMPLOYEES:** 2,700 total. 25 support Northrop Grumman Innovation Systems SLS. Many others support Lockheed and Boeing SLS efforts.

**LOCATION:** East Aurora, NY

### WHAT THEY DO FOR SLS:

Moog provides the Space Launch System Solid Rocket Booster Thrust Vector Control servoactuators used to reliably gimbal the booster nozzles and ultimately manage overall vehicle control during liftoff and the first two minutes of flight. Moog also provides technical support for servoactuator issues at Kennedy Space Center as well as maintaining significant spares at their East Aurora facility.



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## COMING NEXT MONTH:

Testing RS-25 engine controllers

Exploration upper stage engine testing